

REVIEWS OF RECENT BOOKS.

Dendy, PROFESSOR ARTHUR, D.Sc., F.R.S. *Outlines of Evolutionary Biology*. London. Constable and Co., Ltd.; 1912; price 12s. 6d.; pp. 427.

THE scope of this excellent work is sufficiently indicated by quoting the titles of the five parts into which its twenty-seven chapters are divided: (1) The structure and functions of organisms—the cell theory; (2) the evolution of sex; (3) variation and heredity; (4) the theory and evidence of organic evolution: adaptation; (5) factors of organic evolution. The work is profusely illustrated with 188 black and white figures scattered through its 427 pages, although even this statement gives an inadequate idea of the amount, because many of these “figures” are really groups, and some of them (*e.g.*, 75 and 177) are whole-page plates. The printing and general get-up of the book are excellent, and it is singularly free from misprints and clerical errors. Indeed, the glazed surface of the paper and the enormous weight are the only criticisms that can be offered.

Professor Dendy gives a brief but admirable summary of recent evolutionary work upon heredity and the transmission of acquired characters, upon Mendelism and mutation, and on mimicry in insects. In discussing the first of these subjects the author does not seem to allow sufficient weight to the indirect confirmation of Weismann's views afforded by Mendelian and mutationist researches, nor to the transplantation of ova by Heape, or of ovaries by Castle and Philips. In both these experiments the offspring produced were those of the original female and not those of the female into which the transplantation was effected. The latter acted as a foster-mother, and exerted no hereditary influence upon the characters which had been selected for the purpose of the test. The author, in giving an account of fluctuating variations, clearly recognises a germinal as well as a somatic origin. “They are to some extent, no doubt, due to the direct influence of the environment, such as the effect of nutrition upon the size of the organism, but they may also depend largely upon the varying characters of the germ cells from which the organism develops, and especially upon the permutations and combinations of characters which happen to take place in the maturation of the germ cells and in their sexual union or amphimixis” (p. 153).

This clear statement will, it is to be hoped, do something to mitigate the confusion which has been recently introduced into the subject by those leaders of Mendelian research who have described fluctuations as acquired characters not transmitted by heredity. These writers do not hint at any divergence between themselves and de Vries, who has taken immense pains in the attempt to prove—as indeed Galton had shown long before—that fluctuating characters *are* hereditary, that considerable advance can be attained by breeding from their extremes in one direction through a series of generations, but that there is a limit to this advance.

The historical treatment of evolution in Part V. is enriched by numerous well selected quotations from Buffon, Erasmus Darwin, Lamarck, R. Chambers, Charles Darwin, and A. R. Wallace. These passages, which form an important feature of the work, will be of great value to the student.

In the section treating of mimicry the author remarks of the three chief forms of the female *Papilio dardanus* in Natal. “It is obvious that we have here the very opposite of a synaposematic group, for, instead of concentrating upon a single warning pattern, different individuals, even of the same species, adopt totally different patterns in imitation of totally

different models. This case still requires a great deal of explanation, but concerning the facts there can be no doubt" (p. 348).

In considering this most interesting and remarkable example of mimicry it must be remembered that every one of the different mimetic forms resembles a dominant model, which also serves as a centre of mimetic attraction for other species, occasionally *Papilio*s, but generally remote from this group. Furthermore, there can be no doubt that all the geographical races of *dardanus* with mimetic females form a continuous syngamic community, and that the forms of each race tend to infect the adjoining race or races. In this way we may probably account for the existence of the *hippocoön* form in Natal, where its model is rare, and its spread, although in smaller numbers, westward into the south of Cape Colony, where the model is unknown. Such an explanation only accounts, however, for a part of the problem; for there is no doubt that the majority of the mimetic forms are developed in relation to the relative conspicuousness and abundance of the local models. E. B. POULTON.

Hobhouse, L. T. *Development and Purpose; an Essay towards a Philosophy of Evolution.* London. Macmillan and Co.; 1913; price 10s.; pp. xxix., 383.

THOUGH Professor Hobhouse is not one of those philosophers who dread and despise scientific facts, his volume will appeal primarily to those who can enjoy a sustained effort of philosophic reasoning. It may be regarded as essentially a criticism of the notion of evolution, and its learned, laborious, and thorough discussions are intended to lead up to the conclusion that "the conception of a conditioned purpose as constituting the core of the world-process" is "probably true" (p. 368, 372). This conclusion, and the author's ways of arriving at it, will probably provoke abundance of those destructive dialectics in which philosophers excel, but it will be more profitable here to consider rather how far Professor Hobhouse has cleared up the scientific notion of evolution, and removed the scientific objections to it which often suggest themselves. If Professor Hobhouse is found to have contributed to these two objects, the scientific reader will readily pardon the severe abstractness of his argument, which hardly ever descends to the concrete, and the inconclusiveness of a proof which only aims at determining what *must* be, if certain notions of ours really and truly apply to reality, without being able to assert positively that they do.

It is, however, a little disappointing to find how much Professor Hobhouse omits. He nowhere discusses, *e.g.*, whether the term "evolution" is not a misnomer, or perhaps a way of begging a difficult question. Verbally it is suggestive of "preformation," and has often been held, especially by philosophers, to commit science to the belief that nothing can be "evolved" which was not previously "involved." But it may be doubted whether this is really its scientific meaning, and whether the facts to be described would not be better apprehended in terms of "epigenesis." For in "evolution," as biology understands it, "accidental variation" seems an essential feature, and a source of real *novelty*. But if scientific evolution implies novelty, it contradicts all the metaphysics which have assumed that being is a fixed quantity and that change and time must be ultimately unreal. It will not do to slur over this antagonism by an ambiguous use of "evolution."

Again, it can hardly be denied that "evolution" has come to imply "progress"; but how far is this belief scientifically tenable? There is not a little about the known facts to suggest that the reality of evolution may be a creation of human bias and really an illusion. We believe in evolution because we shut our eyes to the facts that there is always some degeneration as well as progression, and nothing apparently to prevent degeneration from prevailing at any time. Every species lives in constant danger of extinction, and the most intelligent societies are not